

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION

(PCT Article 36 and Rule 70)

REC'D 02 NOV 1999

WIPO

PCT

Applicant's or agent's file reference UMV-1474PC	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US99/01382	International filing date (day/month/year) 21 JANUARY 1999	Priority date (day/month/year) 21 JANUARY 1998
International Patent Classification (IPC) or national classification and IPC Please See Supplemental Sheet.		
Applicant THE REGENTS OF THE UNIVERSITY OF MICHIGAN		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets.
☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 0 sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the report
 - II ☐ Priority
 - III ☐ Non-establishment of report with regard to novelty, inventive step or industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 19 AUGUST 1999	Date of completion of this report 16 OCTOBER 1999
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer DAVID GUZO Telephone No. (703) 308-0196

JOYCE BRIDGERS
PARALEGAL SPECIALIST
CHEMICAL MATRIX

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US99/01382

I. Basis of the report

1. This report has been drawn on the basis of *(Substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments):*

☒ the international application as originally filed.

☒ the description, pages (See Attached), as originally filed.

pages _____, filed with the demand.

pages _____, filed with the letter of _____.

pages _____, filed with the letter of _____.

☒ the claims, Nos. (See Attached), as originally filed.

Nos. _____, as amended under Article 19.

Nos. _____, filed with the demand.

Nos. _____, filed with the letter of _____.

Nos. _____, filed with the letter of _____.

☒ the drawings, sheets/~~fig~~ (See Attached), as originally filed.

sheets/~~fig~~ _____, filed with the demand.

sheets/~~fig~~ _____, filed with the letter of _____.

sheets/~~fig~~ _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

☒ the description, pages NONE.

☒ the claims, Nos. NONE.

☒ the drawings, sheets/~~fig~~ NONE.

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the ~~Supplemental Box~~ Additional observations below (Rule 70.2(c)).

4. Additional observations, if necessary:

NONE

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US99/01382

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. STATEMENT**

Novelty (N)

Claims 1-20 YESClaims NONE NO

Inventive Step (IS)

Claims 1-20 YESClaims NONE NO

Industrial Applicability (IA)

Claims 1-20 YESClaims NONE NO**2. CITATIONS AND EXPLANATIONS**

Claims 1-20 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest the claimed genetic constructs comprising a gene operatively linked to a carrier, such as a viral vector which can be a retroviral vector, wherein the carrier is associated with a transmembrane form of a viral glycoprotein wherein said glycoprotein can be derived from the Ebola virus. The prior art does not teach use of the claimed genetic constructs for targeting a gene to a cell which can be in vivo or ex vivo.

The invention has industrial applicability in that the claimed genetic constructs can be used in gene delivery studies wherein a desired gene can be targeted to specific cells or tissues.

----- NEW CITATIONS -----

NONE

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US99/01382

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 10

CLASSIFICATION:

THE INTERNATIONAL PATENT CLASSIFICATION (IPC) AND/OR THE NATIONAL CLASSIFICATION ARE AS LISTED BELOW:

IPC(6): A61K 48/00; C07H 21/04; C12N 15/63, 15/86, 5/10, 15/40 AND US CL.: 424/450, 93.2, 93.21;
536/23.1, 23.72; 435/5, 6, 455, 457, 458, 320.1

I. BASIS OF REPORT:

THIS REPORT HAS BEEN DRAWN ON THE BASIS OF THE DESCRIPTION,
PAGES, 1-14 AND SEQUENCE LISTING PAGES 1-20, AS ORIGINALLY FILED.
PAGES, NONE, FILED WITH THE DEMAND.
AND ADDITIONAL AMENDMENTS:
NONE

THIS REPORT HAS BEEN DRAWN ON THE BASIS OF THE CLAIMS,
NUMBERS, 1-20, AS ORIGINALLY FILED.
NUMBERS, NONE, AS AMENDED UNDER ARTICLE 19.
NUMBERS, NONE FILED WITH THE DEMAND.
AND ADDITIONAL AMENDMENTS:
NONE

THIS REPORT HAS BEEN DRAWN ON THE BASIS OF THE DRAWINGS,
SHEETS, 1-11, AS ORIGINALLY FILED.
SHEETS, NONE, FILED WITH THE DEMAND.
AND ADDITIONAL AMENDMENTS:
NONE



P.B.5818 - Patentlaan 2
2280 HV Rijswijk (ZH)
☎ +31 70 340 2040
TX 31651 epo nl
FAX +31 70 340 3016

Europäisches
Patentamt

Zweigstelle
in Den Haag
Recherchen-
abteilung

European
Patent Office

Branch at
The Hague
Search
division

Office européen
des brevets

Département à
La Haye
Division de la
recherche

VOSSIUS & PARTNER
Siebertstrasse 4
81675 München
ALLEMAGNE

EINGEGANGEN
Vossius & Partner

22. Okt. 2001

Frist
bearb.:

Datum/Date

19.10.01

Zeichen/Ref./Réf.

E 2228 EP

Anmeldung Nr./Application No./Demande n°./Patent Nr./Patent No./Brevet n°.

99905455.4-1223-US9901382

Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire

The Regents of The University of Michigan Technology Management Wolverine Tower 0

COMMUNICATION

The European Patent Office herewith transmits as an enclosure the European search report for the above-mentioned European patent application.

If applicable, copies of the documents cited in the European search report are attached.

☒ Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well.

REFUND OF THE SEARCH FEE

If applicable under Article 10 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	TAKADA ET AL.: "A system for functional analysis of Ebola virus glycoprotein" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA., vol. 94, December 1997 (1997-12), pages 14764-14769, XP002177810 NATIONAL ACADEMY OF SCIENCE. WASHINGTON., US ISSN: 0027-8424 * figure 3; table 1 * ---	1-4,7	A61K48/00 C07H21/04 C12N15/63 C12N15/86 C12N5/10 C12N15/40
X	WO 94 29440 A (UNIV CALIFORNIA) 22 December 1994 (1994-12-22) * examples 7,14 * ---	1,2,4,5,7	
X	YEE J-K ET AL: "A GENERAL METHOD FOR THE GENERATION OF HIGH-TITER, PANTROPIC RETROVIRAL VECTORS: HIGHLY EFFICIENT INFECTION OF PRIMARY HEPATOCYTES" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE. WASHINGTON, US, vol. 91, 1 September 1994 (1994-09-01), pages 9564-9568, XP000674728 ISSN: 0027-8424 * figure 3; tables 1,3 * ---	1,2,4,5,7,8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			C12N C07K
X	RAMANI K ET AL: "NOVEL GENE DELIVERY TO LIVER CELLS USING ENGINEERED VIROSOMES" FEBS LETTERS, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 404, no. 2/3, 1997, pages 164-168, XP000942134 ISSN: 0014-5793 * figure 2; table 1 * -----	1,2,4,6-8	
The supplementary search report has been based on the last set of claims valid and available at the start of the search.			
Place of search THE HAGUE		Date of completion of the search 9 October 2001	Examiner Brouns, G
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 90 5455

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-10-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9429440	A	22-12-1994	US 5512421 A 30-04-1996
			AU 686181 B2 05-02-1998
			AU 7052394 A 03-01-1995
			CA 2164324 A1 22-12-1994
			EP 0702717 A1 27-03-1996
			JP 8511685 T 10-12-1996
			WO 9429440 A1 22-12-1994
			US 5670354 A 23-09-1997

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US99/01382

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : A61K 48/00; C07H 21/04; C12N 15/63, 15/86, 5/10, 15/40

US CL : Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 424/450, 93.2, 93.21; 536/23.1, 23.72; 435/5, 6, 455, 457, 458, 320.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS, Dialog, Biosis, Medline, Biotech

Search terms: Ebola virus, glycoprotein, transmembrane, targeting

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,166,320 A (WU et al.) 24 November 1992, columns 9-10 and claims 1-18.	1-20
A	SANCHEZ et al. The virion glycoproteins of Ebola viruses are encoded in two reading frames and are expressed through transcriptional editing. Proceedings of the National Academy of Sciences. April 1996, Vol. 93, pages 3602-3607, especially page 3604.	3, 12
A	FELGNER et al. Lipofection: A highly efficient, lipid-mediated DNA-transfection procedure. Proceedings of the National Academy of Sciences. November 1987, Vol. 84, pages 7413-7417, especially page 7414.	1-20



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

12 APRIL 1999

Date of mailing of the international search report

11 MAY 1999

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

DAVID GUZO

Telephone No. (703) 308-0196

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/01382

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	VOLCHKOV et al. GP mRNA of Ebola virus is edited by the Ebola virus polymerase and by T7 and vaccinia virus polymerases. Virology. 1995, Vol. 214, pages 421-430, especially page 424.	3, 12

International application No.
PCT/US99/01382

424/450, 93.2, 93.21; 536/23.1, 23.72; 435/5, 6, 455, 457, 458, 320.1